

# CHEM 1013 ESSENTIAL CHEMISTRY (WSTC)

Credit Points 10

Legacy Code 700333

Coordinator Sashi Kant (<https://directory.westernsydney.edu.au/search/name/Sashi Kant/>)

**Description** This subject introduces an investigation of the reactivity of covalent molecules, in particular, of carbon-based compounds. Focussing on introductory chemical dynamics and thermodynamics, you will develop an in-depth understanding of the structure, nomenclature and reactivity of the principal organic functional groups, extending your basic principles of chemistry. You will also understand how molecules are synthesised and the ways they react being important in the function and role of chemistry in biological systems in our domestic and industrial worlds.

**School** Science

**Discipline** Organic Chemistry

**Student Contribution Band** HECS Band 2 10cp

Check your fees via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Undergraduate Level 1 subject

**Equivalent Subjects** CHEM 1006 Essential Chemistry 2 CHEM 1002 Chemistry 2 CHEM 1010 Medicinal Chemistry CHEM 1005 Essential Chemistry 2 LGYB 0462 Chemistry 2 (WSTC) CHEM 1012 Essential Chemistry

**Restrictions** Students must be enrolled at The College. Students enrolled in Extended Diploma programs must have passed 40 credit points of preparatory subjects in order to enrol in this subject.

## Assumed Knowledge

An understanding and competence with basic chemical principles including SI units, chemical symbols, formulas and equations, nomenclature, stoichiometry, the mole concept, bonding, molecular shape and polarity, states and properties of matter, thermodynamics, equilibria, acids and bases, pH and electrochemistry.

## Learning Outcomes

On successful completion of this subject, students should be able to:

1. Explain the structure and function relationship between organic molecules and their physical and chemical properties
2. Recognise and predict the product of the following organic reactions: Elimination reaction of alcohols and alkyl halides, Addition reactions of alkenes, alkynes, aldehydes and ketones, Substitution reactions of alcohols, alkyl halides and carboxylic acid derivatives, Redox reactions of alcohols, aldehydes, ketones, carboxylic acids and esters
3. Use experimental data to find the rate law and propose a mechanism for a chemical reaction
4. Explain the basic thermodynamic principles that govern chemical systems.
5. Demonstrate competence in the manipulative laboratory skills and deductive skills involved in organic synthesis and reaction kinetics.
6. Record the results of their investigations demonstrating awareness of the conventions of scientific writing and graphical presentations.
7. Apply and transfer chemical principles to other contexts such as biological systems.

## Subject Content

1. Introduction to Chemical Dynamics: reactions kinetics - 1st order chemical reactions; rate law and mechanisms of reaction;
2. Introduction to Chemical Thermodynamics; Spontaneity of reaction; Entropy; Enthalpy; Hess's Law
3. Organic chemistry: structure of principal organic functional groups, nomenclature, physical properties and structure; reaction types ? addition, substitution, elimination, redox;
4. Scientific method(s)
5. Setup and performance of a chemical synthesis, including setup and conducting a reflux, and distillation, use of separating funnel and re-crystallisation

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Log/ Workbook	3 hrs x 5 weeks	20	N	Individual	N
Quiz	a) Workshops (combinative of 1h face-to-face peer learning and tutorial, and 1h online work in a computer lab b) Short Answer (tutorial test)	25	N	Individual	N
Essay	1000 words	10	N	Individual	N
Short Answer	1 hour	10	N	Individual	N
End-of-session Exam	2 hours and 20 mins	35	N	Individual	N

## Autumn Blocks

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Portfolio	500 words or equivalent completed in class	20	N	Individual	N
Professional Task	5 x 3 hr practicals including reports completed in class	40	N	Individual	Y
Quiz	2 x 60 mins	40	N	Individual	N

## Spring Blocks

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Portfolio	500 words or equivalent completed in class	20	N	Individual	N
Professional Task	5 x 3 hr practicals including reports completed in class	40	N	Individual	Y
Quiz	2 x 60 mins	40	N	Individual	N

Teaching Periods

## Term 2 (2025)

### Campbelltown

#### On-site

**Subject Contact** Sashi Kant (<https://directory.westernsydney.edu.au/search/name/Sashi Kant/>)

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=CHEM1013\\_25-T2\\_CA\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=CHEM1013_25-T2_CA_1#subjects))

## Spring Block 1 (2025)

### Campbelltown

#### On-site

**Subject Contact** Sashi Kant (<https://directory.westernsydney.edu.au/search/name/Sashi Kant/>)

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=CHEM1013\\_25-SB1\\_CA\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=CHEM1013_25-SB1_CA_1#subjects))